

Oracle Upgrades

WLCG Operation Coordination

20-2-2014

Luca Canali (for IT-DB)

- Upgrade of the Oracle version for all DBs
 - Evolution to the latest Oracle releases
 - Keep the support levels, new features
- New HW
 - HW evolution (more capacity)
 - Move to the BARN (critical power)
- Simultaneous move HW+SW
 - Reduced downtime and risk

- New servers and storage
 - Servers: more RAM, more CPU
 - 128GB of RAM memory (48GB current prod machines)
 - Storage: more SSD cache
 - Newer NetApp model
 - Consolidated storage
- Refresh cycle of OS and OS related
 - Puppet & RHEL 6

- Latest Oracle releases
 - 11.2.0.4
 - 12.1.0.1
 - Note: production now on 11.2.0.3
- Evolution – how to balance
 - Stable services
 - Latest releases for bug fixes
 - Newest releases for new features
 - Fit with LHC schedule

- **11.2.0.4**
 - Terminal patch set of Oracle 11g
 - From January 2016: additional support fees
 - Extended support ends January 2018
- **12.1.0.1**
 - First release of 12c
 - Next Patch Set: 12.1.0.2 coming in Q3 or Q4
 - Educated Guess: users of 12.1.0.1 will have to upgrade to 12.1.0.2 or higher by 2016
- Note
 - **No current Oracle version fits well the entire RUN 2**

- What the DBAs can do:
 - Test upgrades of integration and production databases
 - Share experience across users communities
 - Database CAPTURE and REPLAY
 - Capture workload from production and replay it in upgraded DB
 - Useful to catch bugs and regressions
 - Unfortunately it cannot cover the edge cases

- Application validation against new software releases & new hardware
 - Devdb11 is 11.2.0.4 since October 2013
 - Devdb12 is 12.1.0.1 since September 2013
 - Integration DBs on new HW have been set up in November 2013
 - Test and integration DBs upgraded December/January
 - Test restores of production database servers on new HW and SW available in Q1 2014

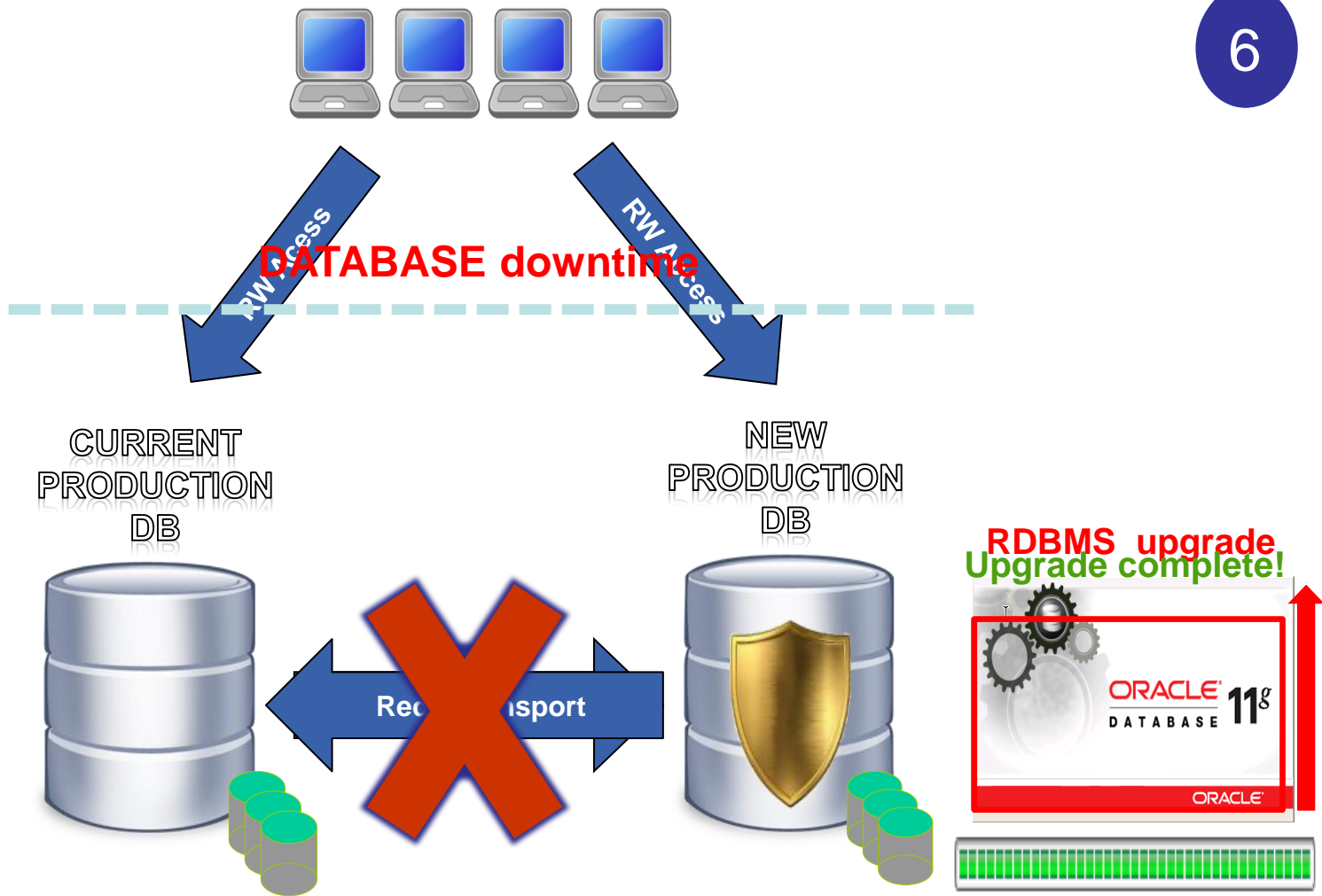
- Validation by the application owners is very valuable to reduce risk
 - Functional tests
 - Tests with 'real world' data sizes
 - Tests with concurrent workload
- The criticality depends
 - on the complexity of the application
 - On how well they can test their SQL
- Note this is not the first major upgrade
 - See 10g -> 11g upgrade in Q1 2012

- Move IT-DB services to **12c gradually**
 - 12c clusterware deployed for RAC now
 - Select a few DB services for 12c now
 - 7 DB clusters being tested and proposed for 12c
 - A few more services candidate to 12c later
 - After tests of 12.1.0.2
 - We work on reduced downtime for upgrade too
 - Ideally another group of DBs upgraded to 12c in December/January
- The rest of the services
 - To 11.2.0.4
 - See **next slide for WLCG** details

- DB services for Experiments/WLCG
 - Target version 11.2.0.4
 - Proposed exceptions (target 12c)
 - ATLARC
 - LHCBR
- ATLARC
 - Archive (low load) + TAGS (being phased out)
- LHCBR
 - Mainly LFC and DIRAC bookkeeping
 - Passed 12c DBA tests with CAPTURE-REPLAY
 - Pending user community tests and approval

- Accelerator DBs already in prod 11.2.0.4
- CMSARC upgraded to 11.2.0.4
- **PVSS** validated for 11.2.0.4
- CASTOR validation for 11.2.0.4 done
- ATLAS RUCIO validated for 11.2.0.4

- Downtime
 - Between **2h** and 4h depending on the complexity
 - Additional time for ADG (read-only replicas) where relevant
- Tnsnames.ora
 - **Unchanged**, we will move network ip aliases
- Fallback
 - If upgrade is stuck we can abort upgrade and restore services on old HW
 - Current prod system is unchanged (exception: in-place upgrades for some of the online DBs)
 - Will keep compatible to 11.2.0.3
 - Will allow rollback to 11.2.0.3 version



- **Integration** and test systems available for functional and stress-testing validation
- Test-upgraded **production** DBs on the future production HW available
 - Tests on the will-be production system
- IT-DB available to work together on **regressions and bugs**, if found
- We wait for the OK of the DB owners for the upgrade of production
 - We **schedule** together downtime for the intervention

- Target: schedule most of the **upgrades in March**
- Ready for upgrade and already scheduled
 - Castor, CMS
- The rest of upgrades should follow soon
 - Note: critical power will soon not be available for what is current production (HW location called RAC10 and RAC11) due to IT works

- Tier 1 DBs
 - Advised to upgrade to 11.2.0.4
 - TRIUMF already upgraded
 - When? Proposal: by the end of June
- Technology evolution for Streams
 - Replace Streams with its successor: Golden Gate (Oracle)
- Status: we are getting ready for rollout
 - Proposed rollout for online-offline: Q2-Q3
 - Proposed rollout for Tier 1s: Q3

- New HW and SW are ready for Experiments/WLCG databases
- Proposed versions for the upgrade
 - Most DBs to **11.2.0.4** for now
 - **Phased** approach to **12c**
- Validation
 - Capture-replay done by DBAs
 - Need **help of application owners** too
- Upgrades
 - Schedule agreed with users community
 - Tentative: most upgrades by **end of March**